NAVAL OCEANOGRAPHIC OFFICE

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Airborne Hydrography

The Naval Oceanographic Office (NAVOCEANO) uses a variety of platforms, including ships, aircraft, satellite sensors, and buoys, to collect oceanographic and hydrographic data from the world's oceans and coastlines. These data are analyzed and utilized in products supporting the warfighter.

Aircraft used in the Airborne Hydrography program at NAVOCEANO can survey large ocean areas and quickly assimilate a synoptic snapshot of many parameters for broad areas.

Surveys are conducted through the Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX) located at Stennis International Airport in Hancock County, Miss., a partnership among NAVOCEANO, the Naval Meteorology and Oceanography Command, the U.S. Army Corps of Engineers (USACE) and the National Oceanic and Atmospheric Administration.

The Past

NAVOCEANO's previous airborne collection efforts were aimed at water column data: temperature/CTD profiles, ambient noise and transmission loss. In 1996, NAVOCEANO began using the Scanning Hydrographic Operational Airborne Lidar Survey (SHOALS) system, a hydrographic airborne laser nautical charting system designed for coastal mapping and charting.

The USACE SHOALS system was retired in 2003 and the knowledge gained over nine years of operation were incorporated into the development of the Compact Hydrographic Airborne Rapid Total Survey (CHARTS) System for the Navy.

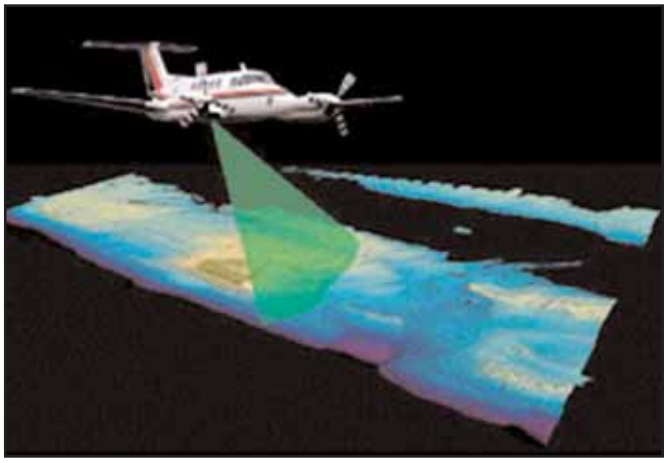
The Present

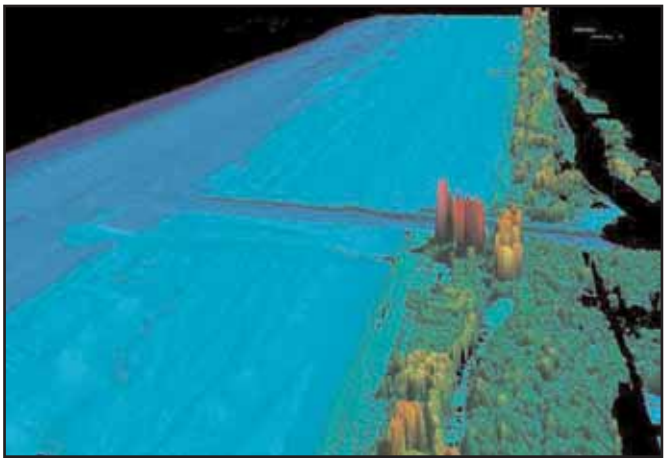
The CHARTS system represents the latest airborne charting and mapping technology. Upgraded in the summer of 2005, CHARTS integrates a 3,000-Hz hydrographic lidar, a 20,000-Hz topographic lidar, a digital imaging camera and a CASI-1500 hyperspectral imager in one system.

CHARTS is installed on a commercial Beechcraft King Air 200 aircraft operated by Kenn Borek Air of Calgary, Canada and staffed with survey personnel from Fugro Chance, Inc. of Lafayette, La. This fusion of government and contractor equipment and personnel makes a very flexible and efficient data collection capability.

A fully integrated ground processing software suite that handles everything from survey planning to data processing to survey report generation matches the speed and efficiency of the airborne data collection equipment.

CHARTS is a total charting tool able to meet both International Hydrographic Organization Order 1 and USACE Class 1 specifications for depth measurement and coastline positioning requirements.





Sensor and Data Fusion

Data fusion software has been developed to exploit this combination of active lidar and passive spectral data. Information extracted from the active lidar pulses is being combined with information from the hyperspectral camera to produce more products from the aircraft data than ever before.

JALBTCX surveyors are able to accurately measure the dimensions of the coastal environment and now have the tools to generate maps and charts describing the characteristics of the seafloor in shallow water and nearshore land.

The upgraded CHARTS system allows surveyors to construct seafloor classification maps delineating various bottom types: sand, mud, coral, grasses, etc. as well as produce maps of water column properties and bottom reflectance maps.

For more information, please contact NAVOCEANO Public Affairs at 228.688.5649 or visit https://www.navo.navy.mil.